

MEMORANDUM

DATE: June 23, 2008

TO: Portland Harbor Natural Resource Trustee Council

FROM: Bob Dexter, Ridolfi Inc. and Jennifer Peers, Stratus Consulting

SUBJECT: Comments on LWG's response to EPA's directive RE: Evaluating Lamprey at the Organism Level

We are submitting this memo to express our concern with the points raised by LWG in their response of June 11, 2008 to EPA's directive dated May 19, 2008 that LWG evaluate Lamprey at an individual organism level. LWG attached (Attachment A) a series of conditions that they would require be accepted to avoid further resistance to EPA's requirement to evaluate lamprey at the organism level. These requirements are stated to be clarifications of the situation as it now stands, but we are not aware of previous discussions of at least some of the points in Attachment A, and we do not agree that their suggestions are appropriate. Accepting them wholesale would potentially unduly restrict EPA's ability to influence the data to be used and the approaches to evaluating lamprey. We request that EPA respond to LWG to clarify remaining issues of confusion to prevent further dispute and delay of the RI/FS schedule.

We have appended specific comments and requests for clarification to each of the points in LWG's Attachment A, below (bold text).

Attachment A – Elements of “Individual Level” Lamprey Risk Assessment

1. Lamprey is being assessed as a target ecological receptor for the detritivorous fish assessment endpoint. The environmental value to be protected is as stated in the February 15 Draft BERA Problem Formulation, specifically:

“Detritivorous fish provide an important source of food for other fish species, birds and mammals. As such, it is important to evaluate the effects of COPCs on this group of ecological receptors.”

With the stipulation that lamprey are to be evaluated as an individual species, lamprey will play dual roles in the BERA: lamprey as the individual species, to be evaluated at the juvenile, benthic life stage; and lamprey as the representative species for detritivorous fish. It would be helpful if EPA were to clarify:

- **What other detritivorous fish species are included in that group**
- **How lamprey and the detritivorous fish class would each be characterized in the BERA. Specifically, for the tissue TRV comparisons would a lower, “organism-level” value be used for lamprey, and a higher, “population-level” value be used for the detritivorous fish class?**

2. The assessment will use only the two measurement endpoints specified in EPA's February 15, 2008 Draft BERA Problem Formulation under Assessment Endpoint 8 – Survival and Growth of

Detritivorous Fish.

- a. Detritivorous fish measurement endpoint 1: water exposure contaminant concentrations compared to AWQCs or TRVs
- b. Detritivorous fish measurement endpoint 2: fish tissue contaminant data (field collected) compared to tissue residue TRVs

We suggest that EPA clarify the conflicting language between the Problem Formulation and the Tissue TRV Derivation Methodology regarding the inclusion of reproductive endpoints for this Assessment Endpoint. The Tissue TRV Derivation Methodology indicates that reproductive endpoints will be included, whereas reproduction was not specifically included in this endpoint in the Problem Formulation. We argue that inclusion of the reproductive endpoint per the Tissue TRV Derivation Methodology is appropriate for two reasons. First, some of the detritivorous fish likely spawn in the study area. Second, the limitation to survival and growth is inconsistent with the actual measurement endpoints because both the AWQCs and the tissue TRVs likely do or will include reproductive endpoints in their derivation (e.g. the measurement endpoints will *de facto* include protection of reproduction).

3. Tissue residue TRVs protective of the organism level of biological organization will be based on the 5th percentile of LOAEL species sensitivity distributions for COPCs for which a species sensitivity distribution (SSD) can be developed. For chemicals with an insufficient amount of residue-effects data to permit development of an SSD, the tissue TRV will be derived from the lowest available residue having an ecologically relevant effect on fish or other aquatic life if fish residue-effect studies are unavailable. Empirical lamprey LC50 data obtained as part of the Portland Harbor ecological risk assessment may be presented in the uncertainty section to argue that a higher SSD percentile is protective of ammocoetes at the organism level.

While there has been discussion of using the bioassay results to “calibrate” the comparisons of the ammocoete sensitivities to the AWQC, we do not believe that those results have relevance to the tissue data.

We also reiterate that using the 5th and 10th percentiles of the SSD may not be protective of the lamprey and detritivorous fish, respectively.

4. The lamprey ammocoete toxicity tests performed by the LWG confirm that the water quality values defined for other assessment endpoints are protective of lamprey ammocoetes at the organism level. Lamprey LC50 data may be introduced in the uncertainty section to argue that higher water quality values are protective of ammocoetes at the organism level.

We disagree that the bioassay data show lamprey to be less sensitive than other fish or aquatic species, but we do agree that the bioassay results are appropriate to discuss in the uncertainty section to “calibrate” the relative sensitivity to lamprey, as suggested in this point.

5. Per the February 15 Draft BERA Problem Formulation reproduction is not part of the assessment endpoint for detritivorous fish. It may be argued in the uncertainty section that TRVs based on reproductive effects are not relevant to the assessment endpoint.

Please see our response to LWG’s Point 2, above.

6. Only field collected water exposure contaminant concentrations will be used to assess measurement endpoint 1. Neither predicted pore water nor predicted surface water concentrations will be used in the BERA.

This requirement seems overly restrictive given the limited water data. At a minimum, the TZW concentration calculations being performed for the protection of benthic organisms should be used as basis of comparison for the ammocoetes.

7. No additional data are needed to complete a satisfactory organism level lamprey BERA, because the field collected lamprey ammocoete tissue contaminant data provide an integrative line of evidence for assessing lamprey ammocoete exposure to contaminants in Portland Harbor.

This point includes two assumptions. The first is that additional tissue data do not need to be collected. The second is that the available data are sufficient and an “integrative line of evidence.” EPA and the Trustees have agreed that trying to get more field samples is not cost effective. However, the individual samples are very limited and not collected from any of the areas with higher sediment contamination. As a result, these data undoubtedly underestimate the possible fish tissue concentrations that exist in other detritivorous fish and that would exist in ammocoetes if they had been collected from the more contaminated areas, and do not even represent a reasonable site average. The intent of this measurement endpoint is to estimate whether the concentrations in the tissues of lamprey and other detritivorous fish exceed the protective TRVs. The present composites in the study area are not representative of the possible area-specific concentrations and therefore are a poor basis for estimating risk to these resources. We request that additional analyses be performed to remedy this data limitation, as discussed in the response to LWG’s point 8 below.

8. No adjustment will be made to the empirical tissue residue data. The data will be assumed to be adequately representative of tissue residues in individual ammocoetes.

As noted above, the available ammocoete tissue data were not collected in locations of higher contamination and were composited over most of the study area. These data are not representative of the tissue concentrations that might be observed in individual ammocoetes if they were exposed in all locations, or of the tissue concentrations of the other detritivorous fish species that are present in those locations. Therefore, a BSAF or similar approach should be used to estimate the potential tissue concentrations that would be seen in the ammocoetes, exposed to at least “hot spots.”

9. The lamprey ammocoete tissue contaminant data collected upstream of Portland Harbor will be used in the risk characterization as background data.

LWG should clarify what this point means. We understand that background comparisons *per se* are only allowed for “natural” substances in the risk assessment, but such comparisons will be allowed in the uncertainty sections for anthropogenic substances. In addition, we note that such use raises the issues of how those data will be handled to develop the appropriate, useable, background concentrations. We also did not perform a careful review of the data from those locations to ensure that they are in fact appropriate for use as background.

The upstream data, which are much more location-specific than those for ammocoetes from the study area, may also be useful to calculate BSAFs to use as discussed above.